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NOTES.

If further evidence were needed of the vigor and development of the new psychological movement, it might be found in the inauguration of the *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, the first number of which appeared on April 20 of this year. The editors are Ebbinghaus, Professor of Psychology at the University of Berlin, well known for his elaborate experimental study of memory and for his researches on sensations of light, and Professor König, of the same university, for some time assistant to Helmholtz, and the author of important studies in the perception of light and color. As co-laborers appear nine of the strongest men in the new movement in Germany: Aubert, Exner, Helmholtz, Hering, Kries, Lipps, G. E. Müller, Preyer and Stumpf. If great names mean anything, the new journal is assured a leading place. The number before us contains in eighty pages brief contributions from nearly all these investigators, psycho physical optics predominating, as will be seen below. Each article is, however, the treatment of a minor point (interestingly and scientifically done in most cases, to be sure), and there is not a *magnum opus* in the lot. How this will be in the future, remains to be seen.

HELMHOLTZ: *Die Störung der Wahrnehmung kleinster Helligkeitsunterscheide durch das Eigenlicht der Netzhaut.*—It is a well known fact that the sensibility for small difference in the intensity of light falls off as the lights to be compared become very bright or very faint. This is to be accounted for, in the first case, by the after-effects of the stimulus, and, in the second case, by the subjective light of the retina. The value found for this last by Volkmann is too small, as observation and experiments (by reducing the sensibility of the optic nerve by means of electrical stimulation) can show. The subjective light further disturbs by its unsteadiness and granular or blotchy distribution. The major part of Helmholtz's paper is a mathematical discussion of the effect of this blotchy distribution on the discriminative threshold, with especial reference to the experiments of König and Brodhun. The formula reached admits of adaptation also to the variation produced by very intense stimuli, and a table calculated by this formula shows a very satisfactory approximation to the results of experiment. In speaking of the vision of objects by very faint light, the author relates the following interesting observation. In his sleeping room, which is so thoroughly darkened that the outline of the window cannot be made out when the moon is in the opposite part of the sky, and the only things to be seen are the flecks of his retinal light, he can yet see his white shirtsleeves when he moves his arms. Considering that this happens when the source of light, the window, is quite invisible, it is a most surprising observation. A number of possibilities suggest themselves, but the actual objective character of the vision appears from the fact that when the hand was stretched toward the window and moved to and fro, its shadowy outline, and even that of the fingers, could be seen more distinctly than when stretched the other way. The meaning of this in a word is that a large faintly luminous surface *at rest* may fall quite below the intensity of the retinal light, and yet furnish enough light to show smaller objects *in motion*. The

relatively rapid changes produced in the retinal sensations by such familiar and voluntary bodily movements as those of the arm are easily distinguished from the ordinary fluctuations of the subjective light.

HERING: *Beitrag zur Lehre von Simultankontrast*.—Though further demonstration of the non-psychological nature of simultaneous contrast is coming to seem to Hering like slaying the dead, he allows himself to offer the crucial experiment recorded in this paper, demonstrating that the color received by the eye is what makes the contrast, and not that received by the mind. He furnishes a different color to the mind from that furnished to the eye, by the use of binocular color-mixing, and if a psychological explanation is to be found for what he sees, it will have to be one that includes a different psychical reaction in the two halves of the visual apparatus to the same perception. The setting of the experiment is in outline as follows: Two inclined plates of colored glass are set up, something as for Ragona Scina's experiment, but inclined toward each other like a roof, so that each eye looks through a different plate, the left, for example, through a red glass, the right through a blue one. When the necessary conditions are fulfilled, the observer sees the white ground below the plates, not in the color of either, but in the color of their binocular mixture, namely a whitish violet. If now a strip of black paper is placed on this white ground in the median plane, and the eyes are fixed on a point some distance above it, the strip will appear double and at the same time, under proper conditions for showing simultaneous contrast. If the psychological explanation was correct, both images should appear a yellowish green. As a matter of fact, the one seen by the right eye with the blue glass appears yellow, that seen by the left eye with the red glass, green. The experiment in this form, however, does not exclude successive contrast. To avoid that, a sheet of black paper is laid over the whole of the white ground and the black strip, and the observer, having allowed his eyes to recover fully from previous color-sensations, puts himself in position and suddenly draws away the black paper. The colors immediately appear as before. (A practiced observer can reverse the experiment by a half-minute's steady fixation, followed by the restoration of the black paper. The left eye then sees a red, and the right a blue after-image of the strip, on a faint olive ground.) It might, perhaps, be objected, that the blue-green image of the left eye would be yellow-green (as it should be on the psychological theory), except for the binocular mixing-in of the blue sensation received by the corresponding points of the right eye, and that the yellow image of the right eye would be yellow-green, except for the red sensation received by the left eye. To this it is to be replied theoretically, that the conditions are not such as to favor the binocular mixing of the general color of one field with the image of the strip in the other eye, and experimentally, that making both plates red or both blue does not make the images of the black strip appear grayish, as it would if there were such a mixture as this objection supposes.

FECHNER: *Ueber negative Empfindungswerte*. Letters written to W. Preyer, between 1873 and 1883, and now edited by him.—This portion of the correspondence seems to have arisen from the close resemblance between the myophysis law which Preyer had determined for the extent of the contraction of a muscle under varying intensity of stimulus, and the psychophysis law of Fechner. The mathematical formulæ lead in both cases to negative values. These Preyer would entirely disregard, making his law extend no further than actual phenomena. Fechner, on the other hand, preferred to follow his formula, and regarded the "negative sensations" to which it leads as imaginary sensations, like the imaginary quantities in mathematics, or, in another aspect, as indicating the amount

by which the actual conditions come short of the zero point of sensation, or, again, somewhat as a bankrupt's debt might be considered as negative property. These letters, of which five (written in 1873-74) are given, aim to explain Fechner's conceptions, and to answer the objections raised by Preyer. Some incidental reference to Delbœuf is made in the second letter. The series is to be continued in the next number.

EXNER: *Das Verschwinden der Nachbilder bei Augenbewegungen.*—Motion of the eyes generally causes the disappearance of after-images and other subjective visual phenomena, and it is not hard to see why this should be so. The perception of subjective sensations is a hindrance in all normal vision, and we neglect them. Motion of the eyes enables us to do this, because subjective images move with the eyes, those of real things do not. We neglect subjective sensations, not consciously, but rather, says Exner, "by means of a central mechanism, which (not wholly unlike a reflex inhibition) catches away such sensations from consciousness without our assistance, indeed without our knowledge." To this explanation of Exner's, E. Fick and Gürber have objected, asserting, on the basis of experiment, that the disappearance of after-images on motion of the eyes, was due to retinal restoration depending on changes of circulation, which in turn depend on changes of intra-ocular pressure caused by the tension of the ocular muscles, closure of the lids, etc., etc. In reply, Exner urges that the disappearance of after-images is only a special instance of what happens with subjective visual phenomena in general, many of which are in no sense dependent on retinal fatigue and restoration. The well known usefulness of intermittent light in bringing out Purkinje's figures and the like, depends on its excluding motion, by which their subjective character would be revealed. The last traces of after-images can be discovered by rapid winking, which is just what should not happen, according to the restoration theory. For a similar reason, such things sometimes appear on taking a new fixation point, or at the instant of opening the eyes in the morning. Furthermore, movement of the eyes with the lids closed, or rhythmical pressure with the finger, do not cause the after-images to disappear. Disappearance might also be expected in the first of these cases on Exner's own theory—an apparent difficulty, which he explains by the absence of one-half of the ordinary basis of discrimination, to wit, the images of outer objects. A further proof of Exner's general thesis is drawn from the experience of microscopists, where, strangely enough, the exact opposite of the habits of normal vision is found. Microscopists are accustomed to move continually the object examined, and finally come to entirely neglect all images in the field that do not move, though the same are readily seen by those less accustomed to the use of the instrument.

AUBERT: *Die innerliche Sprache und ihr Verhalten zu den Sinneswahrnehmungen.*—Various complex motor processes are of vast importance to physiological psychology, and among them the motor processes of speech hold no minor place. It is with reference to these chiefly that this paper of Aubert's is written. He enumerates the factors of speech and their chief disturbances, in aphasia, agraphia, word-blindness, etc., notes the postulates made in common by the various schemata proposed for explanation, and finally comes to the question of how far the control of speech-motions by the sense organs is necessary. On this point he agrees with Stricker, that such control is not necessary, though he would not exclude it from all influence, as witness the first efforts of children in written speech, and the difference in one's own handwriting when the eyes are closed. In regard to the relation of the senses and the motor-image to muscular movements in general, he holds that the

admission of an innervation exactly graded to the amount of contraction of the muscle, and at the command of the motor-image, does not imply that the motorim pulse for an intended movement is therefore exact in extent, direction and time, in advance of practice, or that the extent of the intended movement is, in advance of practice, determining for space-perception as against a wrongly executed actual movement. The state of things may be quite different in respect to sensory control, when new movements are in process of learning, from what it is when they have become reflex through practice. Speaking and writing are learned at too early a stage for auto-observation, and most result is to be expected from the study of simpler movements.

LIPPS: *Ueber eine falsche Nachbildlokalisation und damit Zusammenhängendes*.—When one turns his eyes quickly from one object to another, *e. g.*, from one small flame to another, he can, if skillful enough, observe a transient strip of positive after-image which appears to shoot out from the first object, in a direction contrary to that in which the eyes move. [In trying the experiment, the reviewer finds it easier to get the phenomenon when the head and eyes are moved together; after the thing is once seen in this way, it can more easily be seen when the eyes alone are moved.] The after-image is falsely located, *i. e.*, appears on the wrong side of the object; and this view is supported by the fact that on quickly returning the eyes to their original position, a similar after-image is seen in the same place. Another feature of the experiment, however, was the first to impress Lipps, namely, that the first object seems itself to move in a direction contrary to the motion of the eyes. The two phenomena are closely related, and in explaining the second, the first is essentially explained. The author assumes, according to his theory of space-perception, (this experiment supports that theory in so far as it requires the assumption), that sensations of motion have nothing to do at first hand with visual perceptions of distance, though they may come to stand for them. Now, suppose the eye moves rapidly from a point *O* to a point *P*; the distance passed over in such a motion is *underestimated*, but at the same time the true distance from *O* of the advancing fixation-point is directly *perceived*, and the two united suggests a motion of *O* contrary to that of the eyes. But this suggestion is in contradiction with the immediate perception of the constancy of the distance between *O* and *P*; *O* must then appear again to return to its proper place. When the after-image is seen, its shooting out and return generally take the place of the apparent motion of the object, which is then assigned to a fixed place at the point from which the after-image appears to start. Such is the skeleton of Lipps's explanation; for the evidence supporting several of the steps, and for the results of the experiment under altered conditions, as also for a brief series of objections to the theory of the immediate perception of space by motion of the eye, the reader is referred to the original.

SCHUMANN: *Ueber das Gedächtnis für Komplexe regelmässig aufeinander folgender, gleicher Schalleindrücke*.—Dietze, Wundt's pupil, found, in experimenting on the ability to recognize the identity or difference of number in two successive groups of metronome ticks, without resort to counting, (1) that the most accurate judgments were made when the ticks were given at the rate of 3—5 a second, (2) that there was an unconquerable tendency to break up the series of ticks into rhythmic measures, and (3) that the maximum number of ticks which could be compared depended on the measure into which they fell; if into 2's, 16, if into 8's, 40. Schumann has repeated these experiments, and finds a point of difference in result 2. His subjects were quite able to receive the ticks singly, though the breaking up of the series into measures

rendered comparison easier. Dietze's difficulty may have been either that a habit of receiving them rhythmically had been established, or that his ticks were not all alike in quality. The specific object of the repetition of the experiments was the study of the psychology of such comparisons. The method, according to Schumann's auto-observation (and in this most of his subjects agree), was something as follows. When a series of ticks is given, the subject usually accompanies each tick with some kind of muscular innervation, from which corresponding tensions result. When one standard group is frequently given, it and its number become impressed on the motor and sensory memory. In such a series each tick is expected and prepared for up to the last, and then the expectation and preparation cease involuntarily. Now, when the comparison series is given, the preparation goes on as before, and if the new series is shorter, the preparation outlasts it, if it is longer, the preparation stops too soon, and on this basis the subject makes his judgment. This preparation is influenced by several factors, but under favorable circumstances can be recognized after a very few experiments. One subject, who had been accustomed in astronomical observations to count seconds in groups of 10, could always indicate the tenth tick correctly. The results of Dietze fit in well enough with this explanation, but Wundt's assumption that the last member of such a series lies in the focus of consciousness, and the rest in more and more obscure regions, and that thus a means is offered for determining the *Umfang* or extent of consciousness for such impressions (implying that groups can only be compared when each can be taken into consciousness as a whole), is neither justified by Schumann's auto-observations, nor required by the facts.

Succeeding numbers of this new journal will contain regular reviews of current literature in the fields which it covers, and to this end the sending of off-prints, monographs, etc., is requested. These may be sent either directly to the editors (Prof. Dr. H. Ebbinghaus, Berlin, W. 62, Schillstr. 10; Prof. Dr A. König, Berlin, N. W. 52, Flemmingstr. 1) or through the publisher, Leopold Voss, Hamburg. The yearly volume is to be made up of six numbers, at a subscription price of 15 marks per volume.
E. C. S.

The law recently enacted in New York, removing the insane from the county poor-houses to state asylums, deserves mention as a most substantial gain in the scientific treatment of the insane, and in practical ethics. In the poor-houses the insane were often treated like other paupers and sometimes not separated from them; they were without special medical treatment, exercise in the open air, work or amusement, sometimes inadequately fed and clothed, and often neglected and abused. That this state of things was a means of profit to the petty county officers, is abundantly shown by the three years of hard work required to force the law through the legislature. All credit is due to the State Charities Aid Association for this significant advance.

A case reported by F. Ziehl in the *Deutsch. med. Wochenschr.*, No. 17, 1889, is interesting for its bearings on the independence of the sensations of heat and cold. In consequence of an injury to the lower arm, a woman suffered, besides other sensory paralyses, a complete loss of sensibility to warmth in the area of the ulnar nerve. The sensibility to cold, though blunted (only temperatures of 6° R. or below were felt), was retained.

From a laborious examination of the pupils in two Berlin gymnasiums (including the lighting of the rooms, school seats, age, race, skull

formation, orbital index, refractive condition of eyes, acuteness of vision, time of in-door work, business of father, optical condition of parents, grandparents, and brothers and sisters). Kirchner draws conclusions in support of the present prevailing views of the origin of near-sightedness. The following are among the points made: Race has a small effect; Jewish pupils are somewhat more apt to be short-sighted than German pupils; among the latter the blonde than the brunette. Low orbits are more frequent with the near-sighted, but this the author looks upon rather as an effect than as a cause (in this opposing Stilling). Heredity is important, especially if both parents are short-sighted. But distinctly the most powerful influence is near work with intellectual strain, especially when performed on badly made seats and in poorly lighted rooms. (*Zeitschr. f. Hygiene*, vii, 3, p. 397)

To the Editor of the American Journal of Psychology:

Dear Sir:—May I ask for the publicity of your pages to aid me in procuring co-operation in a scientific investigation for which I am responsible? I refer to the *Census of Hallucinations*, which was begun several years ago by the "Society for Psychical Research," and of which the International Congress of Experimental Psychology at Paris, last summer, assumed the future responsibility, naming a committee in each country to carry on the work.

The object of the inquiry is twofold: 1st, to get a mass of facts about hallucinations which may serve as a basis for a scientific study of these phenomena; and 2d, to ascertain approximately the *proportion of persons* who have had such experiences. Until the average frequency of hallucinations in the community is known, it can never be decided whether the so-called "veridical" hallucinations (visions or other "warnings" of the death, etc., of people at a distance) which are so frequently reported, are accidental coincidences or something more.

Some 8,000 or more persons in England, France and the United States have already returned answers to the question which heads the census sheets, and which runs as follows:

"Have you ever, when completely awake, had a vivid impression of seeing or being touched by a living being or inanimate object, or of hearing a voice; which impression, so far as you could discover, was not due to any external physical cause?"

The "Congress" hopes that at its next meeting, in England in 1892, as many as 50,000 answers may have been collected. It is obvious that for the purely statistical inquiry, the answer "No" is as important as the answer "Yes."

I have been appointed to superintend the Census in America, and I most earnestly bespeak the co-operation of any among your readers who may be actively interested in the subject. It is clear that very many volunteer canvassers will be needed to secure success. Each census blank contains instructions to the collector and places for twenty-five names; and special blanks for the "Yes" cases are furnished in addition. I shall be most happy to supply these blanks to any one who will be good enough to make application for them to

Yours truly,

Professor WM. JAMES,
Harvard University, Cambridge, Mass.